

(a) a nucleotide sequence encoding N-methyl transferase of SEQ ID NO:1 and having the N-methyltransferase enzyme activities of 7-methylxanthine N3 methyl transferase, theobromine N1 methyl transferase and paraxanthine N3 methyl transferase; or

(b) a modified nucleotide sequence obtained by carrying out nucleotide replacement, deletion, or insertion in said nucleotide sequence (a) where a polypeptide encoded by said modified sequence maintains said enzyme activities.

2. (Amended) The isolated DNA molecule as claimed in claim 1, wherein said nucleotide sequence (a) and said modified nucleotide sequence (b) can be hybridized at a temperature ranging from 40° to 80°C for a time period ranging from several hours to overnight.

3. (Amended) The isolated DNA molecule as claimed in claim 1 or 2, wherein said nucleotide sequence (a) consists of SEQ ID NO:2.

4. (Amended) An isolated RNA molecule comprising any of the following nucleotide sequences:

(a) a nucleotide sequence encoding N-methyl transferase of SEQ ID NO:1 and having the N-methyltransferase enzyme activities of 7-methylxanthine N3 methyl transferase, theobromine N1 methyl transferase and paraxanthine N3 methyl transferase; or

(b) a modified nucleotide sequence obtained by carrying out nucleotide replacement, deletion, or insertion in said nucleotide sequence (a) where a polypeptide encoded by said modified sequence maintains said enzyme activities.

5. (Amended) The isolated RNA molecule as claimed in claim 4, wherein said nucleotide sequence (a) and said modified nucleotide sequence (b) can be hybridized at a temperature ranging from 40° to 80°C for a time period ranging from several hours to overnight.

6. (Amended) The isolated RNA molecule as claimed in claim 4 or 5, wherein said sequence (a) consists of SEQ ID NO:3.

7. (Twice Amended) An expression vector comprising the DNA molecule as claimed in claim 1 and a promoter for expressing said N-methyl transferase encoded by the DNA molecule in plant cells.

13. (Twice Amended) A vector comprising a DNA molecule as claimed in claim 1.

14. (Amended) The vector as claimed in claim 13, wherein the vector encodes N-methyl transferase with 7-methyl xanthine N3 methyl transferase, theobromine N1

methyl transferase, and paraxanthine N3 methyl transferase activities in cells of at least one of microorganisms or plants.

16. (Amended) A plant ~~cell~~, plant tissue, or whole plant wherein the plant cell, plant tissue, or whole plant is transformed with the vector as claimed in claim 13 or 14.

17. (Twice Amended) A plant cell, plant tissue, or whole plant as claimed in claim 16, wherein the vector is introduced by infection.

20. (Twice Amended) A method for producing a plant secondary metabolite comprising: culturing the plant cell or plant tissue as claimed in claim 16 to form a plant body, and culturing said plant body to produce a plant secondary metabolite, wherein said plant cell or plant tissue is a Camellia or a coffea plant cell or plant tissue.

21. (Twice Amended) A method for modifying a composition of a plant secondary metabolite comprising: culturing the plant cell or plant tissue as claimed in claim 16 to form a plant body, and culturing said plant body to modify a composition of a plant secondary metabolite, wherein said plant cell or plant tissue is a Camellia or a coffea plant cell or plant tissue.

22. (Twice Amended) The method as claimed in claim 20, wherein the plant secondary metabolite is at least one or more compounds selected from the group consisting of 7-methyl xanthine, paraxanthine, theobromine, and caffeine.

23. (Twice Amended) A method as claimed in claim 20, wherein a transformed whole plant is a Camellia plant or a Coffea plant.

Kindly add the following new claims.

26. (New) A polypeptide comprising an amino acid sequence of SEQ ID NO:1 which has enzyme activities of 7-methyl xanthine N3 methyl transferase, theobromine N1 methyl transferase and paraxanthine N3 methyl transferase.

27. (New) A vector encoding an RNA molecule as claimed in claim 4.

28. (New) The vector as claimed in claim 27, wherein the vector has a function of inhibiting the expression of N-methyl transferase.